

CLAIMS

- Sub B2*
resulting from
1. Thermoplastic copolyamide ~~characterized~~
~~in that it is the result of the reaction between at~~
- 5 least one monofunctional monomer satisfying the
following general formula I:
- $$(AR_1) - R - (R_2B)_n \quad (I)$$
- in which:
- n is an integer greater than or equal
10 to 2, ~~preferably between 2 and 10~~
~~(limits inclusive),~~
 - R₁, R₂ may be identical or different and
represent a covalent bond or an
aliphatic, arylaliphatic, aromatic or
15 alkylaromatic hydrocarbon radical,
 - R is a linear or branched aliphatic
radical, a substituted or unsubstituted
cycloaliphatic radical, a substituted
or unsubstituted aromatic radical
20 possibly comprising several aromatic
rings and/or hetero atoms, or a
polymeric chain possibly containing
hetero atoms,
 - A represents the amine or amine salt
25 functional group, or the acid, ester,
acid halide or amide functional group,

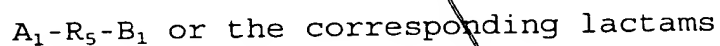
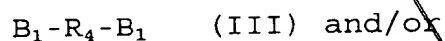
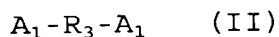
5

-B represents the amine or amine salt functional group when A represents an acid, ester, acid halide or amide functional group, and an acid, ester, acid halide or amide functional group when A represents an amine or amine salt functional group,

and at least one of the difunctional monomers of the following formulae II to IV with, optionally, some of the monofunctional monomers of the following formulae V or VI, or with a prepolymer obtained from at least one difunctional monomer of the following formulae II to IV and, optionally, at least one monofunctional monomer of the following formulae V or VI,

15

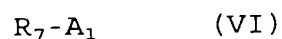
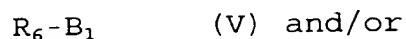
-the difunctional monomers satisfying the following general formulae:



20

(IV)

-the monofunctional monomers satisfying the following general formulae:



25

in which

Sub B2

-A₁, B₁ represent, respectively, an acid, ester or acid chloride functional group and an amine functional group or an amine salt, -R₃, R₄, R₅, R₆, R₇ represent substituted or unsubstituted, aromatic, linear or branched, alkyl hydrocarbon radicals or alkylaryl, arylalkyl or cycloaliphatic radicals possibly including unsaturated groups.

5

2. Copolyamide according to Claim 1, wherein characterized in that the radical R is an aromatic radical.

10

Sub B3

3. Copolyamide according to Claim 1 or 2, wherein characterized in that the molar ratio of the multifunctional monomers of formula I to the sum of the difunctional monomers of formulae II, III, IV and monofunctional monomers of formulae V and VI is between 0.01 % and 5 %, preferably between 0.05 % and 1 %.

15

4. Copolyamide according to one of Claims 1 to 3, wherein characterized in that the monomer of formula I is a compound in which A represents the amine functional group, B represents the acid functional group, n is equal to 2, R represents an aromatic radical and R₁ and R₂ represent a covalent bond.

20

5. Copolyamide according to one of Claims 1 to 4, wherein characterized in that the monomer of formula I is 5-aminoisophthalic acid.

25

Claim 1 6. Copolyamide according to ~~one of Claims 1~~
~~to 3,~~ *wherein* characterized in that the monomer of formula I is
 6-aminoundecanedioic acid.

7. Copolyamide according to ~~one of the~~
~~preceding claims,~~ *having* characterized in that it has a melt
 flow index (MFI) of less than 5 g/10 minutes (measured
 at 275°C under a load of 2160 g).

Claim 1 8. Copolyamide according to ~~one of the~~
~~preceding claims,~~ *having* characterized in that it has a
 10 molecular-mass distribution index D of greater than 2.

Sub B4 9. Process for manufacturing a copolyamide
~~according to one of the preceding claims, characterized~~
~~in that it consists~~ *comprising* in adding, into the reaction mass
 containing difunctional monomers of formulae II to IV
 15 and, optionally, monofunctional monomers of formula V
 or VI, leading to a linear polyamide, a predetermined
 amount of a multifunctional monomer of formula I and
 then in carrying out the polycondensation under the
 temperature and pressure conditions used for the
 20 polymerization of the said linear polyamide.

10. Process for manufacturing a copolyamide
~~according to one of Claims 1 to 8, characterized in~~
~~that it consists~~ *comprising* in synthesizing a prepolymer of a
 linear polyamide from one or more monomers of formulae
 25 II to IV and, optionally, monofunctional monomers of
 formula V or VI, in adding, to this said prepolymer in
 the solid state or in the melt, a predetermined amount

of polyfunctional monomer and then ~~in~~ making ~~the~~ said polyfunctional monomer react with ~~the~~ said prepolymer either in the solid state or in the melt.

11. Process according to Claim 10,
5 ^{wherein} ~~characterized in that~~ an amidification or polycondensation catalyst is added with the polyfunctional monomer.

12. Composition comprising, as matrix, at least one copolyamide according to ^{Claim 1} ~~one of Claims 1 to 8~~
10 and other components chosen from the group comprising reinforcing fillers, filling fillers, antioxidants, stabilizers, pigments, colorants, fire retardants and moulding aids.

Add 41